

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A method of assigning paths through an interconnection network consisting of a plurality of switching elements and a plurality of links coupling the switching elements, the method comprising the steps of:

determining physical restrictions of the interconnection network, the physical restrictions including a configuration and type of switching elements and links coupling the switching elements in the interconnection network;

responsive to the determined physical restrictions of the interconnection network,
determining ~~using physical restrictions of the interconnection network to arrive at~~ a logical representation of an architecture of the interconnection network;

determining traffic patterns of the interconnection network to balance the data traffic through the links coupling the switching elements; and

using the logical representation and traffic patterns of the interconnection network to setup virtual channel identifiers that determine paths through the switching elements and links so that data traffic is more evenly distributed through the interconnection network.

2. (Original) The method according to claim 1, wherein the physical restrictions are based on a speed of the switching element.

3. (Original) The method according to claim 1, wherein the physical restrictions are based on a configuration of the interconnection network.

4. (Original) The method according to claim 1, wherein the physical restrictions are based on a number of stages in the interconnection network.

5. (Original) The method according to claim 4, wherein the number of stages is four in the interconnection network.

6. (Original) The method according to claim 4, wherein the physical restrictions are further based on a number of switching elements in each stage in the interconnection network.

7. (Original) The method according to claim 6, wherein the number of switching elements in each stage in the interconnection network is sixteen.

8. (Original) The method according to claim 1, wherein the physical restrictions are based on a number of ports for each switching element in the interconnection network.

9. (Original) The method according to claim 1, wherein the logical representation of the architecture of the interconnection network is a bit representation of the interconnection network.

10. (Original) The method according to claim 1, wherein the logical representation of the architecture of the interconnection network is a permutation function of the architecture of the interconnection network.

11. (Original) The method according to claim 1, wherein the traffic patterns of the interconnection network are balanced through switching elements of different speeds.

12. (Original) The method according to claim 1, wherein the virtual circuit identifiers identify a source link identifier for the paths through the switching elements.

13. (Original) The method according to claim 12, wherein the source link identifier includes a switching element identifier and an input port identifier.

14. (Original) The method according to claim 1, wherein the virtual circuit identifiers identify a destination link identifier for the paths through the switching elements.

15. (Original) The method according to claim 14, wherein the destination link identifier includes a switching element identifier and an output port identifier.

16. (Currently Amended) A method of assigning paths through an interconnection network consisting of a plurality of switching elements and a plurality of links coupling the switching elements, the method comprising the steps of:

determining physical restrictions of the interconnection network, the physical restrictions including a configuration and type of switching elements and links coupling the switching elements in the interconnection network;

responsive to the determined physical restrictions of the interconnection network, mapping the interconnection network with a virtual circuit identifier, the virtual circuit identifier based on the physical restrictions and traffic patterns of the network; and

using the virtual circuit identifier to assign a path for data through the interconnection network from an input port to an output port.

17. (Currently Amended) The method according to claim 16, wherein the ~~wherein the~~ physical restrictions are based on a speed of a switching element in the network.

18. (Original) The method according to claim 16, wherein the physical restrictions are based on a configuration of the interconnection network.

19. (Original) The method according to claim 16, wherein the physical restrictions are based on a number of stages in the interconnection network.

20. (Original) The method according to claim 19, wherein the number of stages is four in the interconnection network.

21. (Original) The method according to claim 19, wherein the physical restrictions are further based on the number of switching elements in each stage in the interconnection network.

22. (Original) The method according to claim 21, wherein the number of elements in each stage in the interconnection network is sixteen.

23. (Original) The method according to claim 16, wherein the physical restrictions are based on a number of ports for each switching element in the interconnection network.

24. (Original) The method according to claim 16, wherein the logical representation of the architecture of the interconnection network is a bit representation of the interconnection network.

25. (Original) The method according to claim 16, wherein the logical representation of the architecture of the interconnection network is a permutation function of the architecture of the interconnection network.

26. (Original) The method according to claim 16, wherein the virtual circuit identifier identifies a source link identifier for a path through a switching element.

27. (Original) The method according to claim 26, wherein the source link identifier includes a switching element identifier and the input port identifier in the switching element.

28. (Original) The method according to claim 16, wherein the virtual circuit identifier identifies a destination link identifier for a path through a switching element.

29. (Original) The method according to claim 28, wherein the destination link identifier includes a switching element identifier and an output port identifier in the switching element.

30. (Currently Amended) A system for routing data, comprising:
a switching network including a plurality of switching elements and plurality of links coupled to the switching elements for providing a routing path for the data; and
means for determining physical restrictions of the interconnection network, the physical restrictions including a configuration and type of switching elements and links coupling the switching elements in the interconnection network;
a virtual circuit identification algorithm in communication with the switching network for providing an even distribution of data traffic through the switching network, the virtual circuit identification algorithm being responsive to the determined physical restrictions of the interconnection network.

31. (Original) The system according to claim 31, wherein the switching elements are grouped into a number of stages.

32. (Original) The system according to claim 30, wherein the switching network further comprises a logic unit for determining the physical restrictions of the switching network.

33. (Original) The system according to claim 30, wherein the switching network further comprises logic for balancing data traffic through the plurality of links using traffic patterns of the switching network.